IN THE CLAIMS

A complete listing of all the claims is now presented.

Claim 1. (Original).

A fluidized-bed reactor (1) comprising:

a) a pressure-supporting enclosure (2);

b) an inner reactor tube (3) within said enclosure (2) and made from a material which exhibits high transmission for thermal radiation;

c) an inlet (4) at a top of said enclosure (2) for silicon particles (5);

d) an inlet device (6) for supplying a reaction gas (7) which contains a silicon compound in gas or vapor form, the inlet device (6) being of tubular design and dividing the fluidized bed into a heating zone (17) and a reaction zone (18) situated above the heating zone;

e) a gas-distribution device (8) at a bottom of said enclosure (2) for feeding a fluidizing gas (9) into the heating zone;

f) an outlet (10) at the top of said enclosure (2) for reaction gas which has not fully reacted, fluidizing gas and products of reaction (11) which

are in gas or vapor form and collect above a fluidized-bed surface (19);

g) an outlet (12) at the bottom of said enclosure (2) for a product (13);

h) a heater device (14);

i) an energy supply (15) for the heater device (14); and

wherein the heater device (14) is a radiation source for thermal radiation which is arranged outside the inner reactor tube and as a cylinder around the heating zone (17), without being in direct contact with the inner reactor tube, and is designed in such a manner that it uses thermal radiation to heat the silicon particles in the heating zone to a temperature which is such that the reaction temperature is established in the reaction zone (18).

<u>Claim 2. (Original)</u>.

The fluidized-bed reactor as claimed in claim 1,

wherein a space between said inner reactor tube (3) and said pressure-supporting enclosure (2) is provided with thermal insulation (16).

<u>Claim 3. (Original)</u>.

The fluidized-bed reactor as claimed in claim 1,

wherein the heater device is formed over a large area around the entire heating zone and thus forms a cylindrical radiation source.

<u>Claim 4. (Original)</u>.

The fluidized-bed reactor as claimed in claim 1,

wherein the heater device emits thermal radiation with a wavelength of from 0.4 µm to 900 µm.

<u>Claim 5. (Original)</u>.

The fluidized-bed reactor as claimed in claim 4,

wherein the heater device emits thermal radiation with a wavelength of from 0.4 µm to 300 µm.

<u>Claim 6. (Original)</u>.

The fluidized-bed reactor as claimed in claim 1,

wherein the heater device is selected from the group consisting of a heater element made from doped silicon, a heater element made from graphite, a heater element made from silicon carbide, a quartz tube radiator, a ceramic radiator and a wire radiator.

<u>Claim 7. (Currently Amended)</u>.

<u>A fluidized-bed reactor (1) comprising:</u>

<u>a)</u> <u>a pressure supporting enclosure (2);</u>

<u>b)</u> <u>an inner reactor tube (3) within said enclosure (2) and made from a material which exhibits high</u>

transmission for thermal radiation;

c) an inlet (4) at a top of said enclosure (2) for silicon particles (5);

d) an inlet device (6) for supplying a reaction gas (7) which contains a silicon compound in gas or vapor form, the inlet device (6) being of tubular design and dividing the fluidized bed into a heating zone (17) and a reaction zone (18) situated above the heating zone;

e) a gas-distribution device (8) at a bottom of said enclosure (2) for feeding a fluidizing gas (9) into the heating zone;

f) an outlet (10) at the top of said enclosure (2) for reaction gas which has not fully reacted, fluidizing gas and products of reaction (11) which are in gas or vapor form and collect above a fluidized-bed surface (19);

g) an outlet (12) at the bottom of said enclosure (2) for a product (13);

h) a heater device (14);

i) an energy supply (15) for the heater device (14); and

wherein the heater device (14) is a radiation source for thermal radiation which is arranged outside the inner reactor tube and as a cylinder around the heating zone (17), without being in direct contact with the inner reactor tube, and is designed in such a manner that it uses thermal radiation to heat the silicon particles in the heating zone to a temperature which is such that the reaction temperature is established in the reaction zone (18); and

~~The fluidized bed reactor as claimed in claim 1,~~

wherein the heater device is a tube with meandering slots made from graphite with a SiC surface coating which is arranged in the reactor, standing on or hanging from electrode terminals.

Claim 8. (Original).

The fluidized-bed reactor as claimed in claim 1,

wherein all components of the reactor which come into contact with product are selected from the group consisting of an inert material and a component coated with an inert material.

Claim 9. (Withdrawn).

A process for producing high-purity polycrystalline silicon comprising

depositing of a reaction gas above a reaction temperature on silicon particles in a fluidized bed which is vertically divided into a heating zone and a reaction zone;

fluidizing a fraction of the silicon particles in the heating zone with the aid of a silicon-free fluidizing gas and heating to above the reaction temperature;

mixing the heated silicon particles, in an upper region of the heating zone, with the silicon particles from the reaction zone with the heat from the heating zone being transmitted to the reaction zone; and

in the reaction zone, the reaction gas, comprising a silicon compound in gas or vapor form, being deposited on the silicon particles as metallic silicon at the reaction temperature; and

removing the particles which have been provided with the deposited silicon as well as reaction gas which does not react, the fluidizing gas and the gaseous by-products of the reaction being removed from the reactor; and heating the silicon particles to above the reaction temperature in the heating zone by thermal radiation.

Claim 10. (Withdrawn).

The process as claimed in claim 9, comprising

heating the silicon particles in the heating zone by thermal radiation with a wavelength of between 0.4 and 900 μm, and inputting the thermal energy uniformly over the periphery of the fluidized bed by means of large-area heat radiators.